picoLCD 256x64 SideShow

from Mini-Box.com

- USER MANUAL -

Revision 1.0

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Welcome!

Thank you for purchasing the picoLCD 256x64 from mini-box.com !

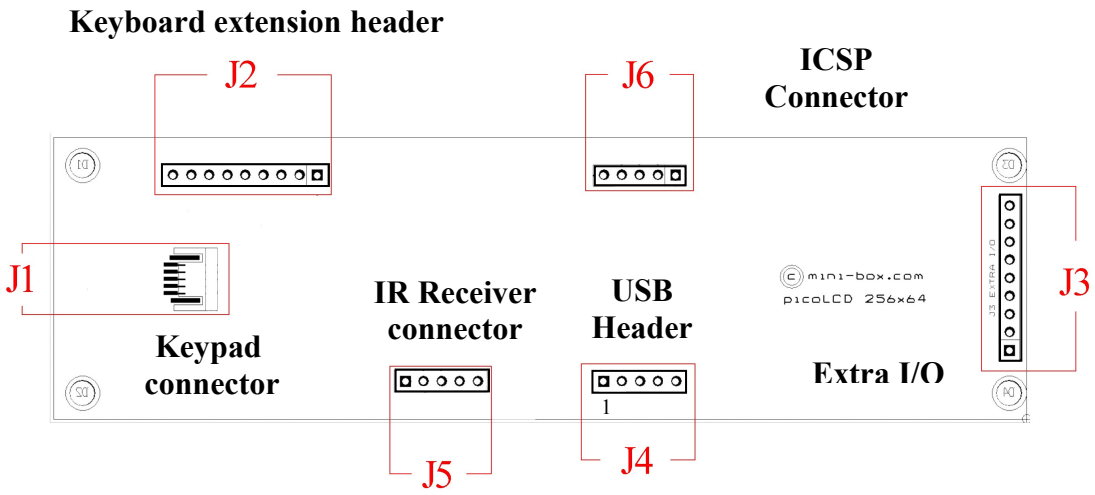
Before you start installing the picoLCD 256x64, take note of the following precautions:

- Unplug the power cord from the wall socket before installing the picoLCD256x64.
- Hold the picoLCD by the edges to avoid touching the display or the integrated circuits on it.
- Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.
- Failure to do so may cause severe damage to the components, peripherals or mainboard.

1. Hardware installation

Depending on the picoLCD 256x64 package that you purchase, picoLCD 256x64 comes with either an external or internal USB connector cable.

Locate the USB header (J4) onto the back of the PicoLCD 256x64, see the picture below:



J1: Keypad connector

J2: Keyboard and keyboard extension header connector
Pin 1 – Column 1
Pin 2 – Column 2
Pin 3 – Column 3
Pin 4 – Column 4
Pin 5 – Row 4
Pin 6 – Row 3
Pin 7 – Row 2
Pin 8 – Key (not connected)
Pin 9 – Row 1

J3: Extra I/O
Pin 1 – RB0
Pin 2 – RB1
Pin 3 – RC1
Pin 4 – RC6
Pin 5 – RC7
Pin 6 – RA0
Pin 7 – RA1
Pin 8 – Key (not connected)
Pin 9 – RA2

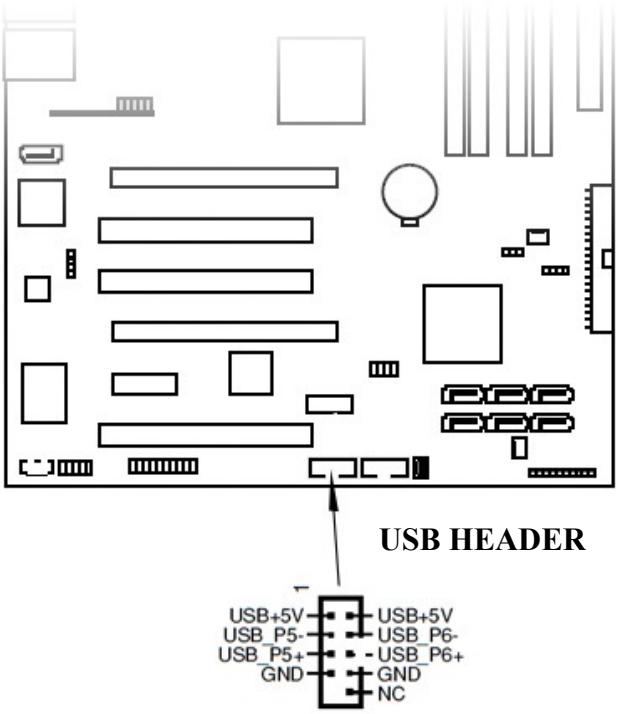
J4: USB connector
Pin 1 – USB V+
Pin 2 – USB DPin
3 – USB D+
Pin 4 – USB GND
Pin 5 – Shield (USB GND)

J5: IR Receiver
Pin 1 – GND
Pin 2– GND
Pin 3 – VCC (5V)
Pin 4 – Key (not connected)
Pin 5 – IR Signal

J6: ICSP connector
Pin 1 – MCLR
Pin 2 – VCC (5V)
Pin 3 – GND
Pin 4 – Data
Pin 5 – Clock

Please see below the situations that you might encounter:

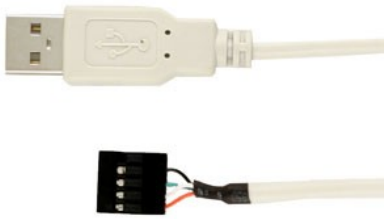
A) The picture below represents a motherboard. Please check the your motherboard's manual and locate a free USB header, like in the picture below:



The connection between the picoLCD256x64 and the motherboard will be done using a USB 5 pin to 5 pin cable.

http://www.mini-box.com/USB-5-pin-to-5-pin-cable

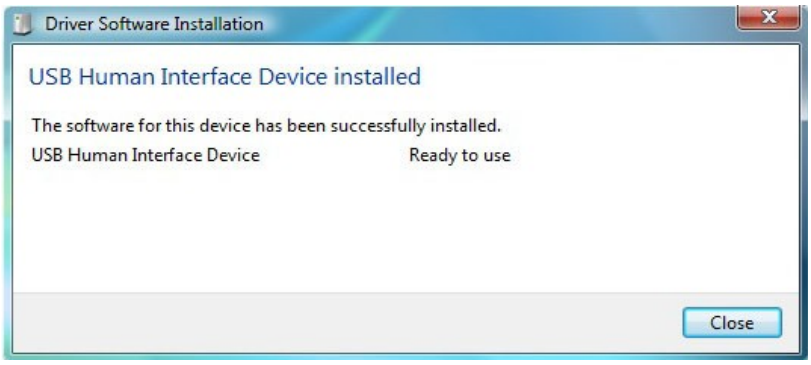
B) Insert the USB cable into a free USB port from your computer.



http://www.mini-box.com/CAB-USB-5pin-typeA

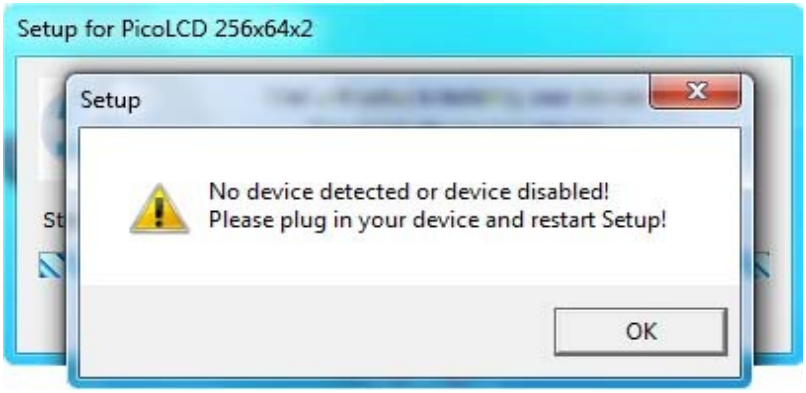
2. Windows Vista driver installation

Windows Vista will automatically detect your device and install the HID drivers.


Driver Software Installation
USB Human Interface Device installed
The software for this device has been successfully installed.
USB Human Interface Device
Ready to use
Close

Download the Windows Vista driver from our webpage at:
http://www.picolcd.com/drivers/
Run PicoLCD256x64_1.0.0.4.exe

In case that you have forgotten to plug in the USB cable,
an error message will occur, like in the picture below.



If the PicoLCD is plugged into an USB slot,
the driver installation will begin.

Wait until the setup will install the device driver.

Setup for PicoLCD 256x64x2
Wait until setup is installing your devices ...
This might take several minutes !!!
Please stop any software which is using Your device!
Status:
Updating device drivers for 1 device(s) ... Please wait!
www.mini-box.com

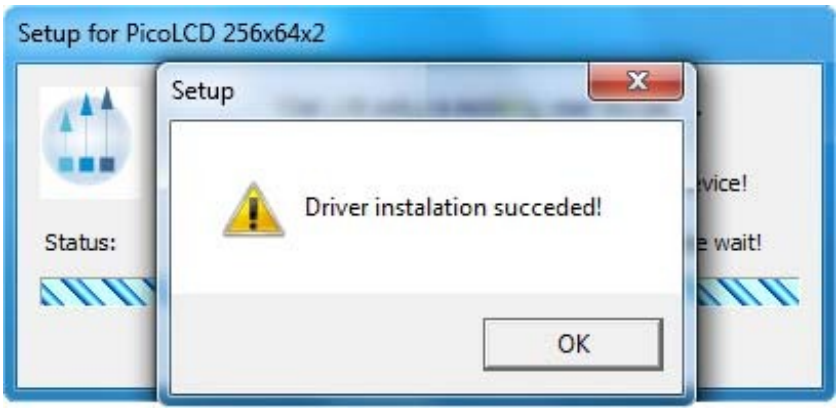
Windows Vista will verify the publisher of the driver software. Accept and install it.

Windows Security
Windows can't verify the publisher of this driver software
Don't install this driver software
You should check your manufacturer's website for updated driver software for your device.
Install this driver software anyway
Only install driver software obtained from your manufacturer's website or disc. Unsigned software from other sources may harm your computer or steal information.
See details

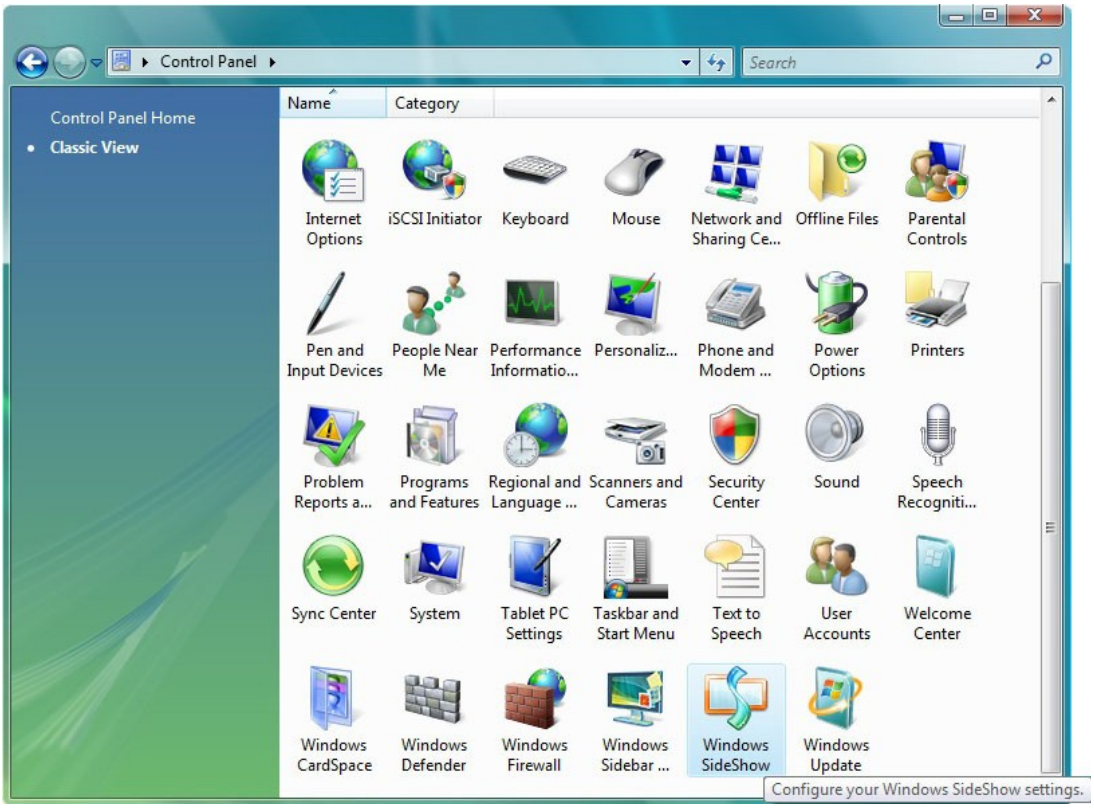
Wait until the setup will install the device driver.

Setup for PicoLCD 256x64x2
Wait until setup is installing your devices ...
This might take several minutes !!!
Please stop any software which is using Your device!
Status:
Updating device drivers for 1 device(s) ... Please wait!
www.mini-box.com

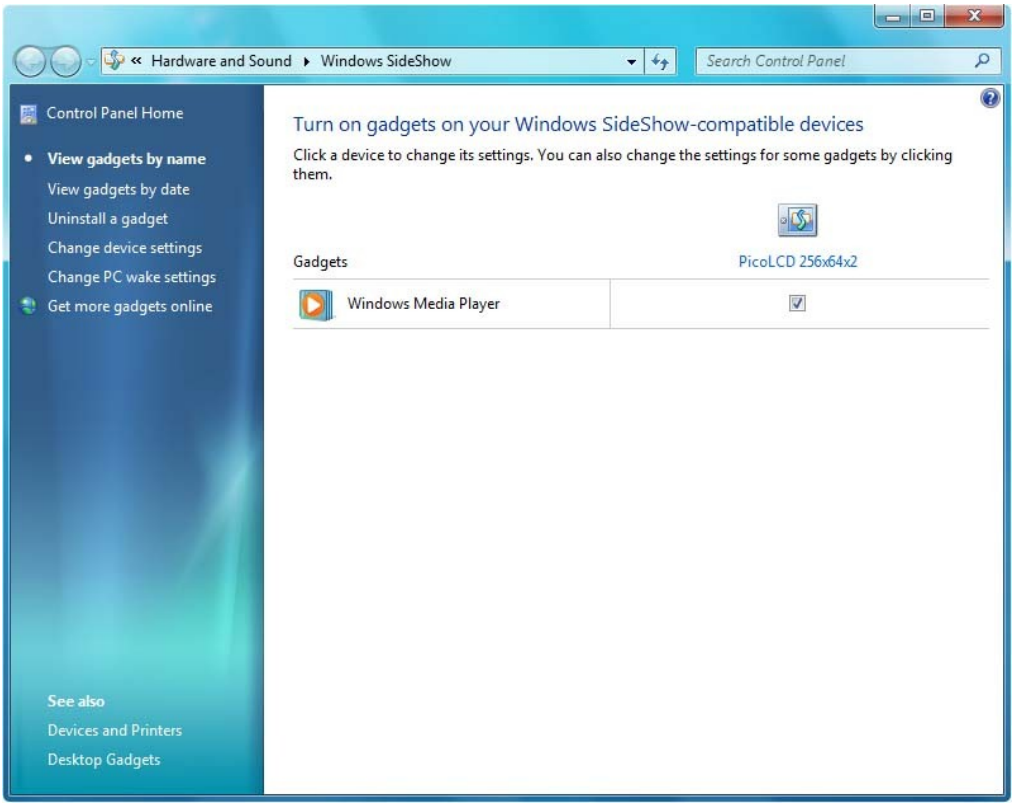
Now you have successfully installed the drivers for the PicoLCD 256x64. Press OK.



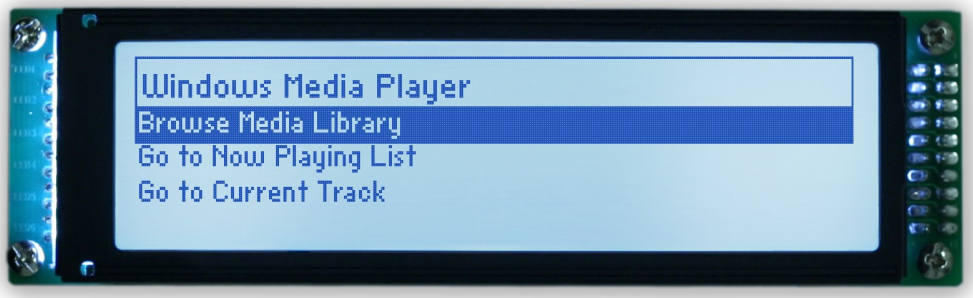
Access the Control Panel and open Windows SideShow.
This will let you to configure your Windows SideShow settings.



By default, Windows Vista will display one gadget. If you want more gadgets, please click “Get more gadgets online”


« Hardware and Sound ▸ Windows SideShow
Search Control Panel
Control Panel Home
View gadgets by name
View gadgets by date
Uninstall a gadget
Change device settings
Change PC wake settings
Get more gadgets online
See also
Devices and Printers
Desktop Gadgets
Turn on gadgets on your Windows SideShow-compatible devices
Click a device to change its settings. You can also change the settings for some gadgets by clicking them.
Gadgets
PicoLCD 256x64x2
Windows Media Player

For example select “Windows Media Player” gadget and on your picoLCD256X64 it will show what the status of your Windows Media Player program, like in the pictures below:



Picture showing Sideshow menu chooser:

More Sideshow gadgets: http://gallery.live.com/default.aspx?pl=7

3. Linux driver installation

3.1. Driver installation and default programs

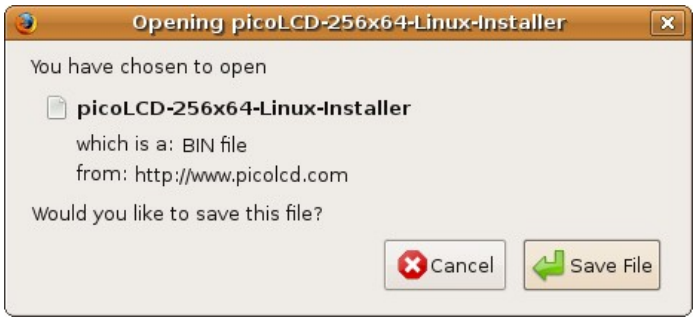
The picoLCD 256x64 driver si based on lcd4linux which is available at http://ssl.bulix.org/projects/lcd4linux/ . The driver has been integrated in lcd4linux sources and it's also available on the above location.

Mini-Box.com offers an easy graphical interface for installing the picoLCD 256x64 drivers. The steps presented below are for a GNOME based user interface but should be similar for KDE users. The installer and drivers wore tested in various distributions including Ubuntu, Fedora and Gentoo.

The software requirements are:

- *An up to date linux distribution. The older version that we tested is Fedora Core 8 and Ubuntu 8.04.*
- *A working usb kernel drivers stack.*
- *At least python 2.5 for user scripts.*

First step is to download the latest drivers from http://www.picolcd.com/drivers



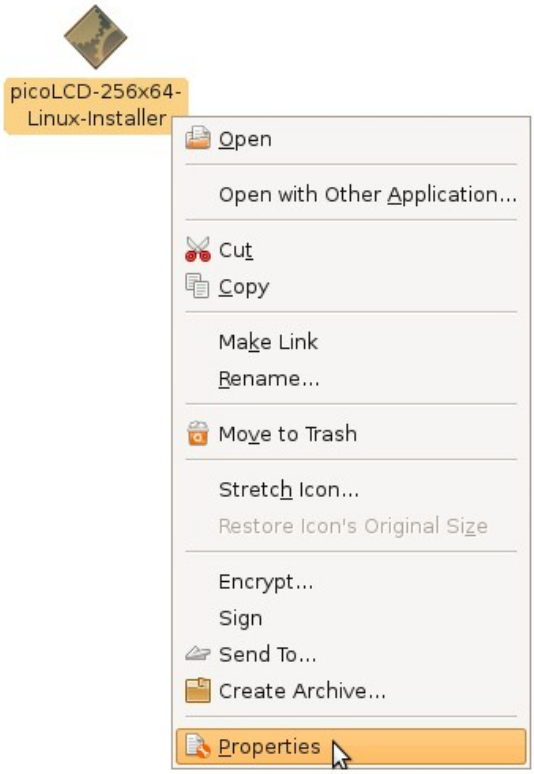
After the download has finished you will need to execute the installer, on some distributions the files downloaded from internet don't have the execute permision allowed so you will need to give the execute permision either right-clicking on the installer icon on your desktop (or where you saved the installer) or by issuing a:

```
chmod +x picoLCD-256x64-Linux-Installer
```

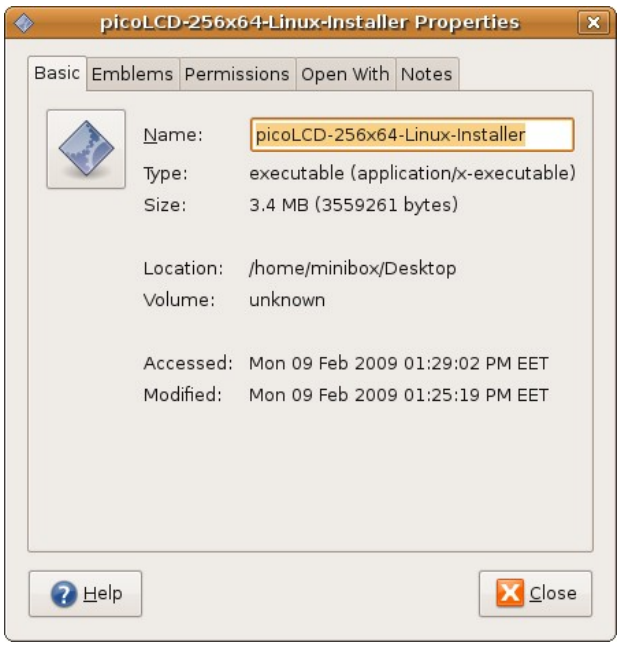
command from a terminal.

The steps to enable the execution of the installer from a graphical interface is presented below:

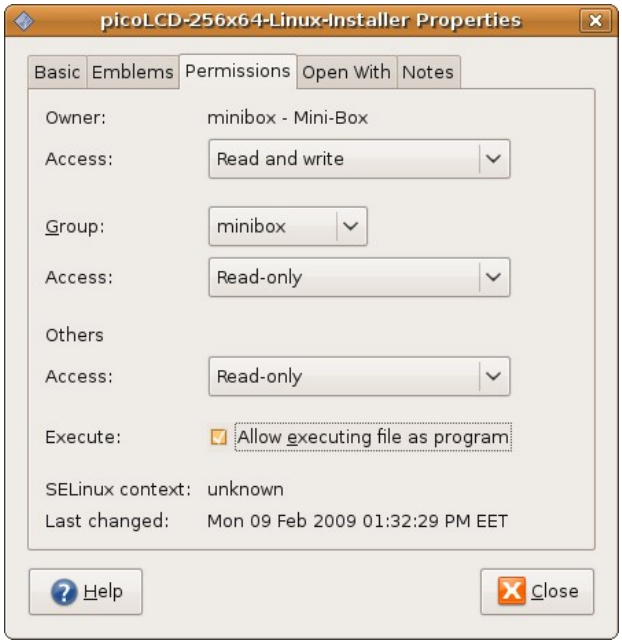
Right click on the installer icon from your download location (we used Desktop) and choose Properties, like in the picture below:



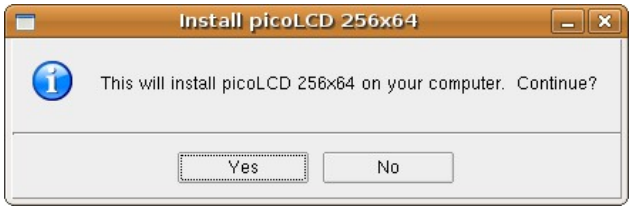
This window will appear:



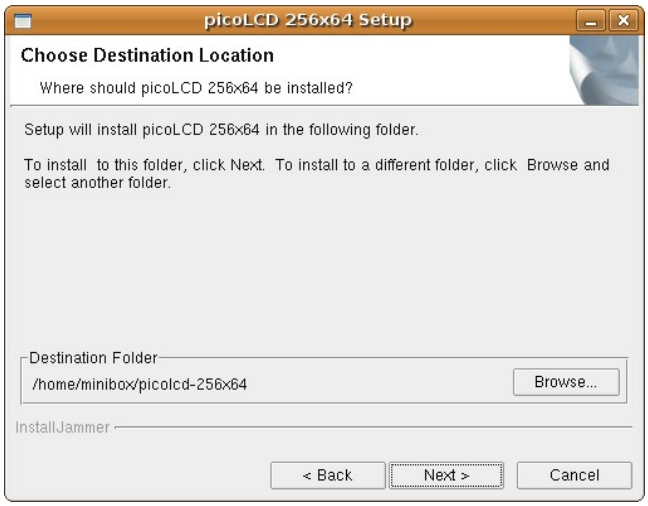
Now click on the **Permissions** tab and select the option:
Allow executing file as program and then click the button **Close**



After doing that, double click on the installer icon.
A welcome screen will be presented press the Next button to begin the installation

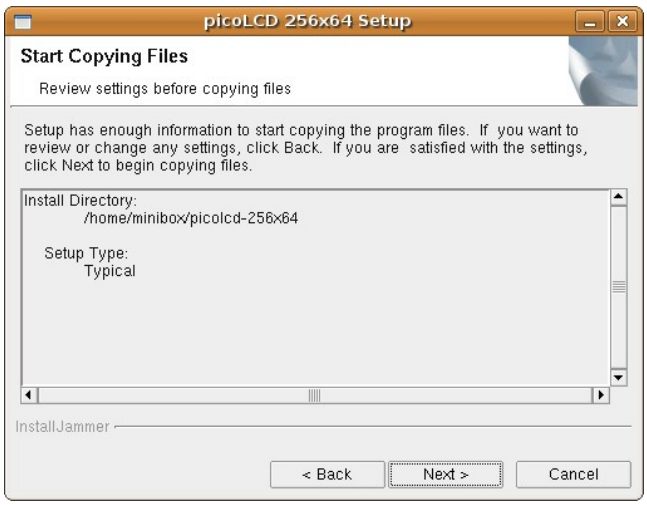


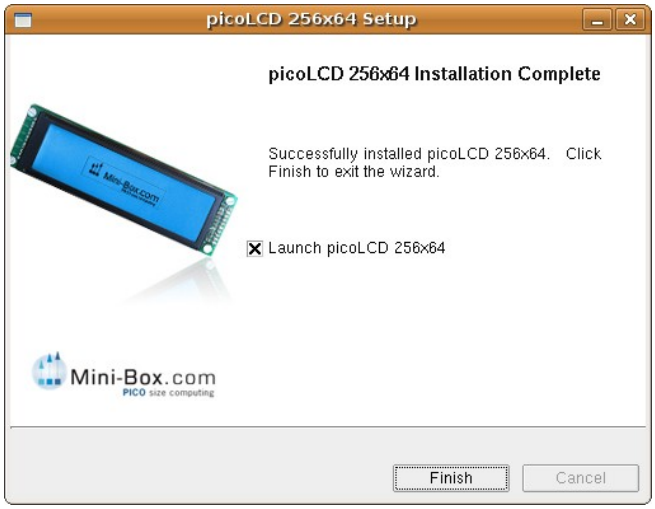
picoLCD 256x64 Setup
Installing applications for picoLCD 256x64 device
This will install picoLCD 256x64 version 1.0 on your computer.
It is recommended that you close all other applications before continuing.
Click Next to continue or Cancel to exit Setup.
Mini-Box.com
Next >
Cancel


picoLCD 256x64 Setup
Choose Destination Location
Where should picoLCD 256x64 be installed?
Setup will install picoLCD 256x64 in the following folder.
To install to this folder, click Next. To install to a different folder, click Browse and select another folder.
Destination Folder
/home/minibox/picolcd-256x64
Browse...
InstallJammer
< Back
Next >
Cancel

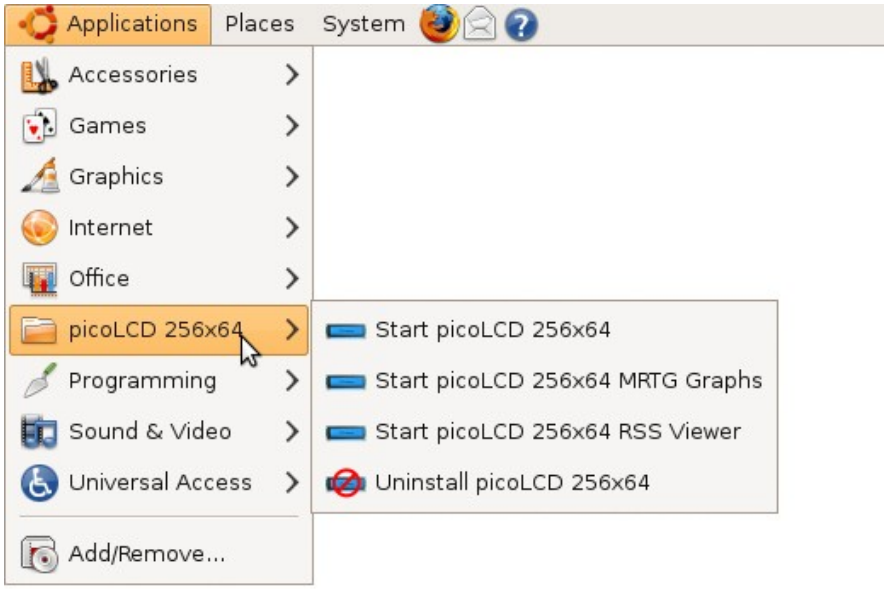
It's advisable to leave picoLCD drivers to be installed in default location (your user folder) but you can change the default location by clicking the Browse button and selecting a new folder.

After you choose a install location press Next button to start copying files.

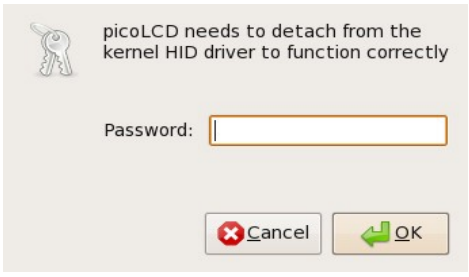

picoLCD 256x64 Setup
Start Copying Files
Review settings before copying files
Setup has enough information to start copying the program files. If you want to review or change any settings, click Back. If you are satisfied with the settings, click Next to begin copying files.
Install Directory:
/home/minibox/picolcd-256x64
Setup Type:
Typical
InstallJammer
< Back
Next >
Cancel



After the installation is completed you can close the installer by pressing the Finish button. The installer automatically creates start menu entries for picoLCD program and it's default applications:



Clicking on one of the menu entries will present a new window which will require you to enter the administration password. This is needed because the picoLCD driver needs a higher level access so it can detach from kernel HID driver to function correctly.



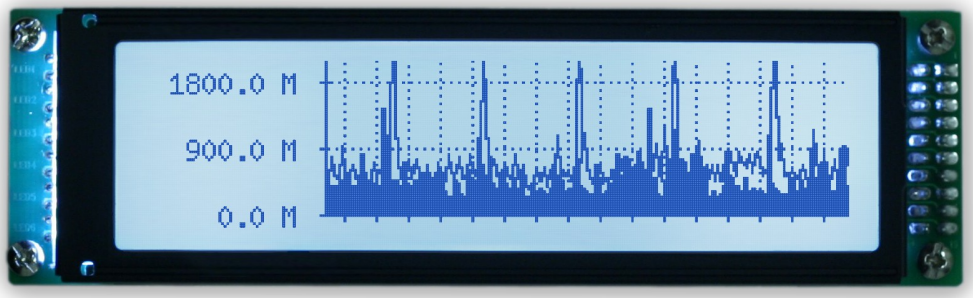
By default there are 3 examples installed the first one it's a overview of your system internals like memory and cpu utilisation, free hard-drive space, network bandwidth in use, hard-drive io in use, date, uptime and system information.
The program will continue to monitor your system on background and report the information on the LCD.

CPU: 82%
RAM: 119/1010MB FREE
IDE: OUT 0.00MB IN 0.00MB
Free Space: / 5548.07MB
ETH: OUT 304KB IN 355KB
CPU Temp: 48C MB Temp: 42C Fan RPM: 3800
Thu,15/01 12:56:54 Uptime 2 d 02:53:12
5.fc8 i686 Intel(R) Pentium(R) 4 CPU 2.66G

The picoLCD MRTG monitors allows MRTG graphs to be rendered on the picoLCD display. To change the location of the MRTG server you will need to edit lcd4linux.conf.mrtg from /home/minibox/picolcd-256x64/picoLCDGraphic/Configs/ with a text editor and change the lines:

```
currentImage 'http://192.168.12.113/mrtg/127.0.0.1_2-month.png'
mrtgDayImageURL 'http://192.168.12.113/mrtg/127.0.0.1_2-day.png'
mrtgWeekImageURL 'http://192.168.12.113/mrtg/127.0.0.1_2-week.png'
```

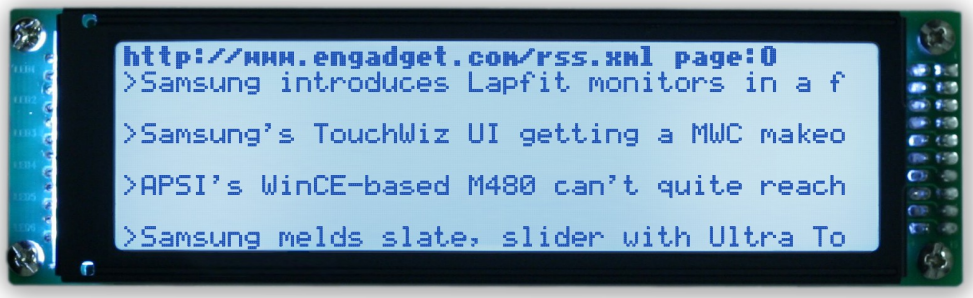
To point to your MRTG server image URLs. You can use the arrows buttons on the LCD to change the current displayed image. A sample MRTG config file is presented in Appendix A.



The picoLCD RSS Viewer allows different RSS feeds to be dowloaded and displayed on the LCD. By default there are 3 feeds installed you can change these feeds by editing lcd4linux.conf.rss from /home/minibox/picolcd-256x64/picoLCDGraphic/Configs/ and change the lines:

```
rss1  'http://slashdot.org/slashdot.rdf'
rss2  'http://www.engadget.com/rss.xml'
rss3  'http://www.linuxsecurity.com/static-content/debian.rss'
```

To point to your desired RSS feeds. You can use the Home and Back button to change between the feeds and arrows buttons to scroll the feed news up and down.


http://www.engadget.com/rss.xml page:0
>Samsung introduces Lapfit monitors in a f
>Samsung's TouchWiz UI getting a MWC makeo
>APSI's WinCE-based M480 can't quite reach
>Samsung melds slate, slider with Ultra To

3.2. Customizing your picoLCD display with plugins and widgets

The easiest way to customize the information displayed by the picoLCD is to edit the lcd4linux.conf file located in installation folder picoLCDGraphic/Configs and add other widgets/plugins, create different behaviors and display data as you see fit. A sample lcd4linux.conf file is available on Appendix B.

Available plugins are:

- Asterisk plugin
- Config plugin
- /proc/cpuinfo plugin
- /proc/diskstats plugin
- DVB plugin
- exec (external command) plugin
- FIFO plugin
- file reading plugin
- GPS (NMEA) plugin
- hddtemp (hard disk temperature)
- I2C sensors plugin
- iconv (charset converter) plugin
- ISDN Monitor (imon) plugin
- ISDN plugin
- KVV plugin
- /proc/loadavg plugin
- mathematical functions plugin

- /proc/meminfo plugin
- MPd plugin
- MySQL plugin
- /proc/net/dev plugin
- netinfo plugin
- POP plugin
- PPP plugin
- /proc/stat plugin
- Python plugin
- Example plugin
- SETI plugin
- statfs plugin
- string functions plugin
- APM plugin
- Time plugin
- uname plugin
- uptime plugin
- WLAN plugin
- XMMS plugin

Available widgets are:

- Bar Widget
- Icon Widget
- Image Widget
- Timer Widget
- GPO Widget (General Purpose Inputs and Outputs)
- Keypad Widget
- Text Widget

More information on working with widgets, plugins can be found on lcd4linux page at:
http://ssl.bulix.org/projects/lcd4linux/wiki/Plugins
http://ssl.bulix.org/projects/lcd4linux/wiki/Layout
http://ssl.bulix.org/projects/lcd4linux/wiki/Evaluator

3.3. Customizing your picoLCD display with external python scripts

Another powerful features is customization through user made scripts. The scripts are written in python which is bundled with most linux distributions. Both MRTG and RSS programs are written in python. A sample python script to fetch MRTG images is presented in Appendix C. Python scripts can be added to the display by creating a new widget and display it on a LCD Row as in the example below.

```
Widget MRTGMinute {
    class 'Text'
    expression currentFile=python::exec('mrtg', 'saveimage', currentImage)
    width 42
     update 100
}

Layout picoLCD {
    Row1 {
        Col1 'MRTGMinute'
    }
}
```

The python::exec plugin will load the mrtg.py script and call the saveimage function from the script with the currentImage as paramater. The variable currentImage is a lcd4linux variable defined in the lcd4linux.conf
The python::exec plugin will look for your scripts in default python search paths and in PYTHONPATH environment variable that can be set by user. By default picoLCD 256x64 programs export PYTHONPATH to your installation folder in picoLCDGraphic/Scripts. You can add your own scripts in that location or modify the existing scripts to suit your needs.

3.4. Controlling the display with the keypad keys

To make use of the picoLCD keys you first need to define a timer which will read the picoLCD keys at an interval and set a variable to hold the current pressed key:

```
Variables {
   n 0
 #the key value taken from picoLCD gpi
   nkey 0
 #current pressed key
}

# A simple timer to get the key values
Widget TimerW {
    class 'Timer'
    expression n=LCD::GPI(1);nkey=n!=0?n:nkey
    active 1
    update 100
}
```

This will read key pressed every 100ms and store the key values in nkey variable. A table for current key / values mapping is pressented in Appendix D.

You will also need to define a widget that does an action when a given key is pressed:

```
#The keypad up key will display text “Arrow Up”
Widget GPO_kup {
   class 'GPO'
   expression nkey==5?'Arrow Up':'Other key';nkey==5?1:0
   update 300
}
```

The last thing you need to do is to declare the key widgets and the timer defined above in the picoLCD layout section:

```
Layout picoLCD {
    Row1 {
        Col1 'GPO_kup'
    }

    Timer1 'TimerW'
    GPO1       'GPO_kup'

}
```

4. Appendixes

4.1. Appendix A Sample MRTG file for Linux MRTG display plugin

```
EnableIPv6: no
WorkDir: /var/www/mrtg
XSize[127.0.0.1_2]: 155
YSize[127.0.0.1_2]: 30
Options[127.0.0.1_2]: noborder, nobanner, nolegend, integer
#kMG[127.0.0.1_2]:,,M
YLegend[127.0.0.1_2]: Bytes/s

Target[127.0.0.1_2]: 2:lcsources@127.0.0.1:
SetEnv[127.0.0.1_2]: MRTG_INT_IP="192.168.12.113" MRTG_INT_DESCR="eth0"
MaxBytes[127.0.0.1_2]: 12500000
Title[127.0.0.1_2]: Traffic Analysis for picolcd.mini-box.com
PageTop[127.0.0.1_2]: <h1>Traffic Analysis for picolcd.mini-box.com</h1>
               <div id="sysdetails">
                       <table>
                               <tr>
                                       <td>System:</td>
                                       <td>picolcd.mini-box.com</td>
                               </tr>
```

```
                </table>
            </div>
```

4.2. Appendix B Sample lcd4linux.conf file for Linux picoLCD software

```
# The display settings
Display picoLCD {

    Driver   'picoLCDGraphic'

    Size     '256x64'

    Contrast  230

    Backlight 1

    Inverted   1

    Icons     1

}



#Variables needed for script to function
Variables {

   n 0
 #the key value taken from picoLCD gpi
   nkey 0
 #current pressed key
   # the current URL that will be passed to python script
   currentImage 'http://192.168.12.113/mrtg/127.0.0.1_2-month.png'

   # currentImage will change it's value when arrows keys are pressed
   mrtgDayImageURL 'http://192.168.12.113/mrtg/127.0.0.1_2-day.png'

   mrtgWeekImageURL 'http://192.168.12.113/mrtg/127.0.0.1_2-week.png'

   #currentFile variable holds the location of the saved image by the pyhon script
   currentFile ' '

   tick 500

   tack 100

   minute 60000

}



# A simple timer to get the key values
Widget TimerW {

    class 'Timer'

    expression n=LCD::GPI(1);nkey=n!=0?n:nkey

    active 1

    update 100

}
# This widget will display the URL of the current image on the LCD and
# also save the location of the downloaded file in the currentFile variable
# export PYTHONPATH which should point to the scripts location
Widget MRTGMinute {

    class 'Text'

    expression currentFile=python::exec('mrtg', 'saveimage', currentImage)

    width 42

    #update minute

    update 100 }
```

```
# This is a graphic widget that will display the image downloaded by the above
# python script. CurrentFile variable is set by the MRTGMinute widget
Widget BandwidthImage {

    class 'Image'

    file currentFile

    visible 1

    inverted 0

    reload 1

    update minute

}


#The keypad up key which will change the current image to the mrtg week graphs
Widget GPO_kup {

   class 'GPO'

   expression currentImage=nkey==5?mrtgDayImageURL:currentImage;nkey==5?1:0

   update 300

}


Widget GPO_kdown {

  class 'GPO'

  expression currentImage=nkey==7?mrtgWeekImageURL:currentImage;nkey==7?1:0

  update 300

}

Layout picoLCD {

    Row1 {

        Col1 'MRTGMinute'

    }


    Layer 1 {

        X0.Y0 'BandwidthImage'

    }


    Timer1 'TimerW'

    GPO2       'GPO_kup'

    GPO3       'GPO_kdown'


}


Display 'picoLCD'

Layout  'picoLCD'
```

4.3. Appendix C Sample python script for Linux picoLCD

```
import urllib
import shutil

download_path = "/tmp/"

def saveimage(imageurl):
        filename = imageurl.split('/')[-1]
        tmpname = filename + ".tmp"
        try:
                urllib.urlretrieve(imageurl, download_path + tmpname)
        except IOError:
                return "Error downloading file"
        else:
                shutil.move(download_path + tmpname, download_path + filename)
                return download_path + filename
```

4.4. Appendix D Key and values mapping for Linux software

Key name	**Key Value**
Back	0x01
Home	0x02
Up Arrow	0x05
Down Arrow	0x07
OK	0x06